

IN THE APPLICATION

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FOR A

DRILL ADAPTER FOR AN ICE AUGER

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DRILL ADAPTER FOR AN ICE AUGER

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

5 The present invention relates to ice augers, and more particularly to an apparatus that enables an ice auger to be powered by a battery-powered drill.

2. DESCRIPTION OF THE RELATED ART

10 The use of ice augers is well known in the prior art. Typically, a fisherman uses an ice auger during winter to bore a hole through the ice covering a lake for access to fishing below. Early embodiments of ice augers were hand-powered, as exemplified by U.S. Pat. No. 4,819,744, issued April 11, 1989 to T.J. Caswell (funnel hole ice auger). However, boring a hole through a thick layer of ice using a hand-powered ice auger
15 required a great expenditure of strength and energy. As a result, other means for powering ice augers have been developed. For example, U.S. Pat. No. 3,602,321, issued August 31, 1971 to G. Kortschaga; U.S. Pat. No. 3,705,632, issued December 12, 1972 to L.J. Burke; and U.S. Pat. No. 3,731,751, issued May 8, 1973 to H.H. Rusco, all teach devices that use the power of a

snowmobile to drive an ice auger. Although each of these devices enables a person to avoid hand drilling, each also requires a snowmobile, which is not an insignificant expense.

Similarly, U.S. Pat. No. 5,213,170, issued May 25, 1993 to R.H. Savitski; U.S. Pat. No. 5,950,738, issued September 14, 1999 to T.J. Caswell et al.; and U.S. Pat. No. 6,076,617, issued June 20, 2000 to J.M. Berner, teach motorized augers, but each of these devices requires the expense of a separate dedicated motor.

Likewise, U.S. Pat. No. 4,872,518, issued October 10, 1989 to A.B. Crippin, and U.S. Pat. No. 4,971,161, issued November 20, 1990 to R.P. Godell, teach an adapter for powering an ice auger by, respectively, a chainsaw and a grass-trimming tool. Although useful for those individuals possessing a chainsaw or grass-trimming tool, these devices are not useful for other individuals.

Since the advent of battery-powered drills, attempts have been made to provide an adapter for powering an ice auger with a drill. Because battery-powered drills are portable and prevalent, an adapter for such a purpose is desirable. Two embodiments of such an adapter have been offered for sale over the Internet auction website known as ebay.com, both web pages

published at least as of February 19, 2004. However, each of these has several drawbacks. First, while each includes a safety shield to prevent the auger from falling through the hole produced by the auger, the shield is attached to the adapter such that it spins with the adapter and therefore presents a potential safety hazard should the shield contact clothing or the operator when drilling. Second, each includes a permanently integrated driver bit that cannot be easily replaced if bent or broken. And third, neither includes a spring to help maintain a constant tension between the adapter and the auger, which would thereby act as a shock absorber.

Consequently, none of the above inventions and patents, taken either singly or in combination, is seen to describe the instant invention as claimed and therefore a drill adapter for an ice auger solving the aforementioned problems is desired.

SUMMARY OF THE INVENTION

The drill adapter for an ice auger is an adapter that allows an ice-fishing auger to be powered by a portable drill, preferably a battery-powered drill. The device includes a receiver tube that is configured for attachment to an ice auger shaft, and an end cap with a removable driver bit for attachment

to a battery-powered drill. The device also includes a floating shield that spins freely around the receiver tube, thereby allowing rotation of the shield to stop should the shield come in contact with clothing or the operator while powering an ice auger, and a spring within the receiver tube that absorbs vibration.

Accordingly, it is a principal object of the invention to provide a device that allows an ice auger to be powered by a portable drill.

It is another object of the invention to provide a drill adapter for an ice auger that has a floating shield, which is independent to the rotation of the receiver tube and can therefore remain stationary while the auger is being powered by a drill.

It is another object of the invention to provide a drill adapter for an ice auger that has a floating shield, which can be grasped to assist removal of the auger from the hole the auger produces.

It is another object of the invention to provide a drill adapter for an ice auger that has a floating shield, which has a diameter larger than that of the cutting diameter of the auger

to thereby prevent the auger from falling through the hole it produces.

It is a further object of the invention to provide a drill adapter for an ice auger that incorporates a spring to help
5 minimize vibration and thereby act as a shock absorber.

Still another object of the invention is to provide a drill adapter for an ice auger that incorporates a removable driver bit that can be easily replaced if damaged.

It is an object of the invention to provide improved
10 elements and arrangements thereof for the purposes described which presents safety features and is inexpensive, dependable and fully effective in accomplishing its intended purposes.

These and other objects of the present invention will become readily apparent upon further review of the following
15 specification and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a drill adapter for an ice auger according to the present invention shown attached to an ice auger.

Fig. 2 is an exploded, perspective view show a drill adapter for an ice auger according to the present invention in relation to an ice auger.

Fig. 3 is a perspective view of a drill adapter for an ice auger according to the present invention.

Fig. 4 is an exploded view of a drill adapter for an ice auger according to the present invention.

Fig. 5A is a perspective view of a drill adapter for an ice auger according to the present invention shown coupled with an extension tube and an ice auger.

Fig. 5B is a longitudinal cross-sectional view of an extension tube for a drill adapter for an ice auger according to the present invention.

Similar reference characters denote corresponding features consistently throughout the attached drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention is a drill adapter for an ice auger, designated generally as 10 in the drawings. The adapter 10 is designed to allow an ice auger to be powered by a battery-powered drill. As shown in Figs. 3 and 4, the adapter 10 includes a receiver tube 20, an end cap 50 with a removable

drill driver bit 62, a floating shield 30, an internal spring 40, a C-ring clip 70, a locking pin 76 and a setscrew 60.

The receiver tube 20 is configured for attachment to an ice auger shaft S. Receiver tube 20 is cylindrical in shape with an upper end 24 and a lower end 22. Near the upper end 24 is a circumferential groove 28 for receiving the C-ring clip 70, and near the lower end 22 is a pair of apertures 26 that are positioned on opposite sides of the tube 20. The locking pin 76 is dimensioned to fit through the apertures 26. The locking pin 76 has two elongated segments that are pivotally attached to each other and pivot between a coaxial position and a position in which the two segments are normal to each other. The locking pin 76 and C-ring clip 70 are attached to opposite ends 74 of a chain 72.

The floating shield 30 is a disk with a center aperture 32. The center aperture 32 has a diameter slightly greater than the outside diameter of the receiver tube 20, and therefore the floating shield 30 spins freely when positioned around the receiver tube 20.

The end cap 50 is cylindrical in shape with an axial bore 56, a circumferential collar 54, and a threaded aperture 58 extending perpendicularly from the axial bore 56. The axial

bore 56 is configured to receive the drill driver bit 62, which is elongated with a hexagonal cross-section and can be secured to a battery-powered drill. The threaded aperture 58 is configured to receive the setscrew 60. The drill driver bit 62 is positioned in the axial bore 56 such that a portion of the drill drive bit 62 extends upward from the end cap 50 for attachment to a battery-powered drill, and is secured in the axial bore 56 by tightening the setscrew 60 in the threaded aperture 58. The top 42 of the internal spring 40, which has an outside diameter that is less than the inside diameter of the receiver tube 20, is attached to the bottom 52 of the end cap 50.

When the adapter 10 is assembled, the bottom 52 of the end cap 50 is disposed in the upper end 24 of receiver tube 20 such that the end cap collar 54 rests on the rim of the receiver tube upper end 24. Within the receiver tube 20, the internal spring 40 extends downward from the bottom 52 of the end cap 50. The floating shield 30 is disposed on the receiver tube 20 near its upper end 24 such that the floating shield 30 is positioned between the C-ring clip 70 and the end cap collar 54 and spins freely around the receiver tube 20.

The adapter 10 is used to power an ice auger with a battery-powered drill by inserting the shaft S of the ice auger I into the lower end 22 of the receiver tube 20 such that the apertures 26 in the receiver tube 20 align with the apertures A in the ice auger shaft S and then inserting the locking pin 76 through the apertures 26 and A. Then, with a battery-powered drill attached to the exposed end of the drill driver bit 62, the ice auger I can be powered by the drill.

When the adapter 10 is being used, the floating shield 30 can be held to steady the ice auger I as it spins, and the internal spring 40 absorbs vibration being transmitted from the ice auger to the drill. The floating shield 30 also prevents the auger I from falling through the hole it produces and provides a means for grasping the adapter 10 and auger I to aid in the removal of the auger I from the hole. Additionally, the drill driver bit 62 can be removed and replaced should it become damaged.

The adapter 10 may also include an extension tube 80 that extends the distance between the drill and the ice auger I, as shown in Fig. 5A, thereby allowing the ice auger I to be lowered deeper into a layer of ice. As shown in Fig. 5B, the extension tube 80 has an upper end 82 and a lower end 84, with the

diameter of the lower end 84 being greater than that of the upper end 82. Near each of the ends 82 and 84, is a pair of apertures 86 and 88 that are positioned on opposite sides of the tube 20. A support plug 90 and internal spring 92 are disposed within the extension tube 80. The support plug 90 is secured inside the extension tube 80 via a dowel pin 94 passing through the tube 80 and support plug 90. The internal spring 92 is attached to the bottom of the support plug 90. To use the extension tube 80, the upper end 82 is coupled with the receiver tube 20 and the lower end 84 is coupled with the shaft of an ice auger by a locking pin 96 passing through the lower apertures 88 in the extension tube 80 and the ice auger I.

All of the components of the adapter 10 are constructed of metal and the end cap 50 is welded to the receiver tube 20.

It is to be understood that the present invention is not limited to the embodiment described above, but encompasses any and all embodiments within the scope of the following claims.